

## REMARKS

Claims 1, 6, 11, 16, 18, 37, 50, 53, 55-60, and 62-63 are currently amended. Claims 2, 19 and 23-34 are cancelled. Claims 3-5, 7-10, 12-15, and 20-22 are original. New claims 64-67 are added. Claims 17, 35-36, 38-49, 51-52, 54, and 61 were previously presented. Accordingly, claims 1, 3-18, 20-22, and 35-67 are pending in the application.

### 1. Objection to Drawings

The drawings are objected to as being hand-drawn. On January 14, 2004, Applicant submitted Formal Drawings to the Patent Office. The Patent Office received these drawings as evidenced by the attached Post Card. For convenience, Applicant has attached copies of the formal drawings submitted on January 14, 2004. Please notify Applicant if the Formal Drawings are not acceptable and/or must be re-filed with the Patent Office.

### 2. Rejection of Claim 11 under 35USC§112

Claim 11 stands rejected under 35USC §112 for failing to point out and distinctly claim the invention. In response, Claim 11 is amended to specify that “the waveguides have lateral sides that extend down to the base.” Independent Claim 1 provides that the waveguides are on the base. Accordingly, claim 11 requires that the waveguides are positioned on the base and have lateral sides that extend down to the base. This claim language is in accordance with the description at pages: 10, line 2; page 15, line 2; and page 16, line 3.

### 3. Rejection of Claims 16, 50, 59, and 60-63 under 35USC§112

Claims 16, 50, 59, and 60-63 stand rejected under 35USC§112 for failing to point out and distinctly claim the invention. In response, Applicant has amended these claims to specify that “each waveguide has a thickness that is more than 1.4 times a width of the waveguide.”

### 4. Rejection of Independent Claim 1 under 35USC§102

Independent Claim 1 stands rejected under 35USC§102 as being anticipated by U.S. Patent Number 6,973,234 (Hasegawa).

Independent Claims 1 is amended to specify that multi-mode waveguides include “input waveguides, transition waveguides, and an output waveguide” and that the waveguides intersect one another “such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide.” Independent Claim 1 also specifies “at least a portion of the input waveguides includ(e) a contraction taper configured to taper the width of a light signal traveling along the input waveguide toward the output waveguide.”

Hasegawa does not teach a plurality of transition waveguides combining light signals from input waveguides onto an output waveguide where at least a portion of the input waveguides include contraction tapers. Accordingly, Hasegawa does not anticipate Independent Claim 1.

#### 6. Rejection of Independent Claims 18, 53 and 62 under 35USC§103.

Independent Claims 18, 53, and 62 stand rejected under 35USC§103 as being unpatentable over U.S. Patent Number 6,973,234 (Hasegawa) in view of U.S. Patent Number 6,925,228 (Kamei).

Claims 18, 53, and 62 are amended to specify that multi-mode waveguides include “input waveguides, transition waveguides, and an output waveguide” and that the waveguide intersect one another “such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals the output waveguide.” Claims 18, 53, and 62 also specifies that “the output waveguide include(es) an expansion taper configured to taper the width of a light signal traveling along the output waveguide.”

Modifying the device of Hasegawa with Kamei does not teach or suggest a plurality of transition waveguides combining light signals from input waveguides onto an output waveguide where the output waveguide includes an expansion taper. Accordingly, Independent Claims 18, 53 and 62 are patentable over Hasegawa in view of Kamei.

#### 7. Rejection of Independent Claims 37 and 60 under 35USC§103

Independent Claims 37 and 60 stands rejected under 35USC§102 as being unpatentable over Hasegawa in view of U.S. Patent Number 6,925,228 (Kamei).

Independent Claims 37, and 60 are amended to specify that multi-mode waveguides include “input waveguides, transition waveguides, and an output waveguide” and that the waveguide intersect one another “such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide.” Independent Claims 37 and 60 also specify “at least a portion of the input waveguides includ(e) a contraction taper configured to taper the width of a light signal traveling along the input waveguide.”

Modifying the device of Hasegawa with Kamei does not teach or suggest a plurality of transition waveguides combining light signals from input waveguides onto an output waveguide where at least a portion of the input waveguides include contraction tapers. Accordingly, Claims 37 and 60 are patentable over Hasegawa in view of Kamei.

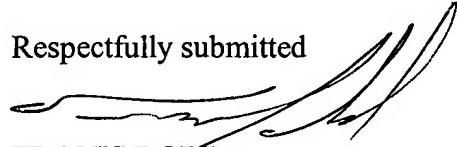
#### 8. Claims 3-17, 20-22, and 35-36, 38-51, 53-59, 61, 63

Each of claim 3-17, 20-22, and 35-36, 38-51, 53-59, 61, 63 depends from Independent Claim 1, 18, 37, 52, 60, or 62. Since the Independent Claims are believed to be in condition for allowance, claim 3-17, 20-22, and 35-36, 38-51, 53-59, 61, 63 are also believed to be in condition for allowance.

## CONCLUSION

In light of the Claim amendments presented above, Applicants believe they are entitled to a letters patent. The Examiner is encouraged to telephone the undersigned with any questions.

Respectfully submitted

  
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